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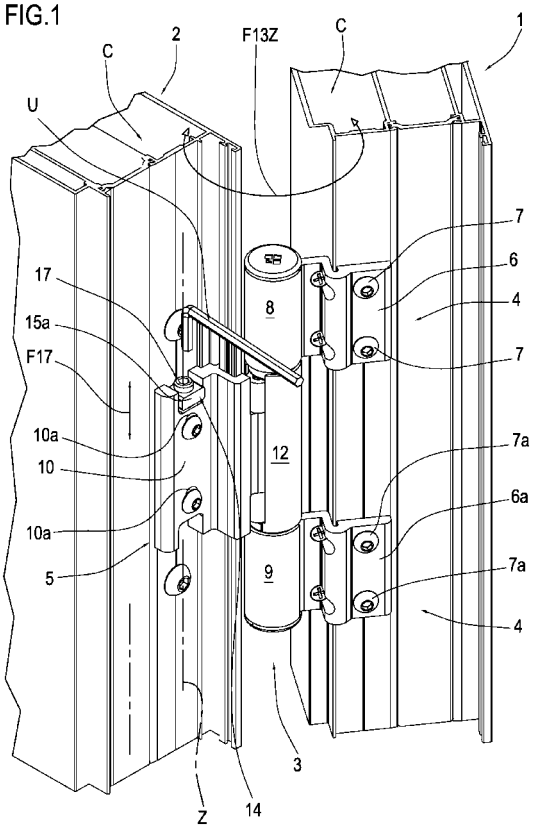
(54) Hinge for doors or windows

(57) Described is a hinge for doors and windows having a fixed frame (1) and a movable sash (2) connected to each other by the hinge (3). The hinge (3) comprises: a first hinge body (4) having a plate (6) for fastening, through screw means (7), to a profile of the fixed frame (1) and a pair of cylindrical sockets (8, 9), which are coaxial and spaced from each other; a second hinge body (5) having a plate (10) for fastening, through screw means (11), to a profile of the movable sash (2) and a single cylindrical socket (12) operatively positioned between the two sockets (8, 9) of the first hinge body (4); a shared hinge pin (13) housed in the three sockets (8, 9, 12) to define an axis of rotation (13Z) of the sash (2), and adjustment means (14) for adjusting the position of the sash (2) along an axis (Z) parallel to the axis of rotation (13Z), and acting on one of the two hinge bodies (4, 5); the adjustment means (14) comprise a pin (15) associated with the profile of the movable sash (2) and having a housing (16) for accommodating a screw means (17) for adjusting the sash (2) along the axis (Z) relative to the fixed frame (1); the screw means (17) is operatively in head contact with one end of the fastening plate (10) of the second hinge body (5) in order to configure a fixed point (P) for abutting and opposing the plate (10) itself so as to lift or lower the sash (2) relative to the hinge bodies (4, 5), in a configuration where the screw means (11) for fastening the plate (10) are loose. [Figure 1]

FIG.1



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Description

[0001] The present invention relates to a hinge for doors or windows.

[0002] In the door and window trade, hinges of a type known in the prior art as "three-wing hinges" are used to connect a fixed frame and sash of a fixture (door or window), especially, but not limited to, one made of aluminium.

[0003] More specifically, hinges of this kind are used for fixtures of medium to heavy weight and where the profile for fastening the accessories is flat. In other words, the fixture profiles do not have auxiliary fastening flanges or profiles protruding from them and, consequently, the gap between fixed frame and sash is very small (in the sash closed configuration with the profiles close together). The hinge is composed of two hinge bodies fastened to the respective profiles of the fixed frame and sash.

[0004] Each hinge body is in turn composed of a fastening plate and a cylindrical portion for housing a shared hinge pin.

[0005] Each plate is fastened to the fixed frame or to the sash using screws that pass through the respective profile and are tightened into counter plates housed inside the profile to make the fastening more secure.

[0006] The hinge body intended for connection to the fixed frame has two cylindrical portions joined, for example, by a single fastening plate to form a sort of C shape.

[0007] Alternatively, the two cylindrical portions may have a single, independent fastening plate, thereby forming, in actual fact, three individual hinge bodies.

[0008] Irrespective of how the hinge body associated with the fixed frame is structured, these two cylindrical portions are, in use, positioned on each side of the single cylindrical portion of the other hinge body, which is fastened to the movable sash.

[0009] The hinge pin passes through the three cylindrical portions, positioned coaxially with each other, and joins the two hinge bodies.

[0010] With a hinge of this kind, mounting is quick and easy, but no provision is made for adjustments of the sash relative to the fixed frame, such as, for example, an adjustment along an axis "Z" parallel to the axis of rotation of the hinge pin, that is to say, an adjustment of the sash in height.

[0011] The only possibility of adjustment is to insert annular shims between the cylindrical portions of the two hinge bodies in order to vary the height of the sash: this type of adjustment is not very precise, however.

[0012] To improve adjustment after mounting this type of hinge, one prior art solution is disclosed in patent document GB 2.317.642.

[0013] The hinge in that document comprises two further elements in addition to those described up to now: the plate for fastening the hinge body associated with the profile of the fixed frame is divided into two parts and, in the vicinity of the bottom end of this plate, there is an auxiliary element constituting an adjuster of the height position of the hinge, that is to say, of the sash relative to the frame.

[0014] More specifically, the two parts of the plate consist of a fixed portion attached to the profile and a slide portion (comprising the cylindrical portions that accommodate the pin) that is slidable on the fixed portion.

[0015] In light of this, the slide portion has two slot-shaped holes for the passage of the screws for fastening to the counter plate behind it.

[0016] The auxiliary element is a small block fixed to the profile of the fixed frame. The small block features an opening into which is screwed an adjustment screw, with vertical axis, positioned under the movable portion of the aforesaid plate. For adjusting the hinge, that is, the sash, first the fixing screws of the slide are slackened, the adjustment screw is turned clockwise or anticlockwise in such a way as to raise or lower the slide portion to the desired position and then the slide is tightened in that position.

[0017] This type of adjustment, however, is not free of disadvantages, not only because the adjustment system is not very practical, making it awkward for the installer to work, but also because it is hard to hold the hinge in place during adjustment.

[0018] In particular, the location of the adjustment screw at the bottom end of the hinge body forces the installer to perform a tricky manoeuvre (especially in the case of hinges at the bottom of the fixture) without a visual reference on the adjustment screw itself.

[0019] Moreover, when the fixing screws of the slide of the C-shaped hinge body are slackened, the slide remains in a critical situation where it has to bear the full weight of the sash. In effect, the sash is associated with the other hinge body and hence, is located at a certain distance from the position of the slide which, when the fixing screws arte slackened, tends to move sideways away from the fixed frame.

[0020] In light of this, the movement of the slide (and hence, of the sash) makes the axial adjustment more difficult, thus making the task of setting the sash in the desired position a highly time-consuming one.

[0021] To this must be added the fact that this type of adjustment is not feasible for hinges with three independent hinge bodies.

[0022] This invention has for an aim to provide a hinge for doors or windows that overcomes the above mentioned drawbacks of the prior art.

[0023] More specifically, this invention has for an aim to provide a hinge for doors or windows which allows adjustment of the position of the sash in height relative to the fixed frame, that is to say, a quick and sure adjustment along an axis parallel to the shared hinge pin.

[0024] A further aim of the invention is to provide a hinge for doors or windows that makes the sash height adjustment visually clear and convenient for the installer.

[0025] A yet further aim of the invention is to provide a hinge for doors or windows that allows adjustment of the height of the sash irrespective of whether the hinge

body associated with the fixed frame has a single or a double plate.

[0026] These aims are fully achieved by the hinge for doors or windows according to this invention, as characterized in the appended claims.

[0027] More specifically, the hinge has means for adjusting the movable sash which comprise a pin which is associated with the profile of the movable sash and which feature a housing for accommodating a screw for adjusting the sash along an axis parallel to an axis of rotation of the hinge relative to the fixed frame. The screw means is operatively in contact with one end of the plate for fastening the second hinge body to configure a fixed point for abutting and opposing the plate itself so as to lift or lower the sash relative to the hinge bodies, in a configuration where the screw means for fastening the plate are loose.

[0028] The configuration of the adjustment means thus allows the hinge plate to be used as an abutment element to modify the position of the sash. In short, the adjustment occurs directly on the sash and not on the hinge, with the advantage of minimizing the effort required for adjustment and achieving high positioning precision.

[0029] Preferably, the screw means (a grub screw) is placed in contact with the upper end of the plate for fastening the second hinge body.

[0030] This position makes the operation of screwing or unscrewing the grub screw more practical (also visually) for the installer.

[0031] These and other features are more apparent from the detailed description, set out below, of a preferred non-limiting example embodiment of the invention, with reference to the accompanying drawings, in which:

- Figure 1 is a partial perspective view of a hinge according to the invention, applied to a door or window fixture;
- Figure 2 is an exploded, perspective view of the hinge of Figure 1.

[0032] With reference to the accompanying drawings, in particular Figures 1 and 2, the hinge of the invention is denoted by the numeral 3; the hinge 3 is intended for the articulated connection of fixtures such as doors and windows (not fully illustrated since they are of known type).

[0033] In brief, these doors and windows have a fixed frame 1 and a movable sash 2 connected to each other by the hinge 3.

[0034] The hinge 3 described herein is used for doors or windows of medium to heavy weight and where the profile for fastening the accessories is flat.

[0035] In light of this, the fixture profiles do not have auxiliary fastening flanges or profiles protruding from them and, consequently, the gap between the fixed frame 1 and the sash 2 is very small (in the sash closed configuration with the profiles close together).

[0036] The drawings illustrate a single hinge 3 purely by way of an example, although usually at least two hinges of the same type are used for the articulated connection of the fixed frame and sash of the door or window fixture.

[0037] The hinge 3 comprises at least a first and a second hinge body 4 and 5 associated, respectively, with the fixed frame 1 and sash 2.

[0038] The first hinge body 4 has a plate 6 for fastening, through screw means 7, to a profile of the fixed frame 1 and a pair of cylindrical sockets 8, 9 which are coaxial and spaced from each other.

[0039] In short, the first hinge body 4 may be said to define a C shape.

[0040] In the embodiment illustrated in the drawings by way of an example, the first hinge body 4 comprises two independent plates 6 and 6a, each of which has respective screw means 7 and 7a and a respective socket 8 and 9, thereby defining, in actual fact, a hinge 3 with three independent bodies.

[0041] The second hinge body 5 has a plate 10 for fastening, with screw means 11, to the profile of the movable sash 2 and a single cylindrical socket 12 which is operatively positioned between the two sockets 8, 9 of the first hinge body 4.

[0042] The hinge 3 also comprises a shared hinge pin 13 housed inside the three sockets 8, 9 and 12 to define an axis of rotation 13z of the sash 2 (see also arrows F13Z).

[0043] The hinge 13 further comprises adjustment means 14 for adjusting the position of the sash 2 along an axis Z parallel to the axis of rotation 13Z and acting on one of the hinge bodies 4 or 5.

[0044] In other terms, these means allow the sash 2 to be adjusted in height relative to the fixed frame 1.

[0045] According to the invention, the adjustment means 14 comprise a pin 15 associated with the profile of the movable sash 2.

[0046] The pin 15 comprises a housing 16 (illustrated by a broken line) for accommodating a screw means 17 for adjusting the sash 2 along the axis Z relative to the fixed frame 1.

[0047] The screw means 17 is operatively in head contact with one end of the plate 10 for fastening the second hinge body 5 to configure a fixed point P for abutting and opposing the plate 10 itself so as to lift or lower the sash 2 relative to the hinge bodies 4 and 5, in a configuration where the screw means 11 for fastening the plate 10 are loose.

[0048] In practice, the adjustment performed using the pin 15 and the screw means 17 uses the plate 10 (which remains fixed) as an abutment to move the sash 2 up or down (see arrows F17) by screwing or unscrewing the screw means 17.

[0049] This condition allows reduced working effort without having to work directly on any part of the hinge 3 which acts merely as a reference abutment for the adjustment.

[0050] Preferably, the screw means 17 is a grub screw

which can be operated using a suitable tool U.

[0051] Preferably, (see also the drawings), the screw means 17 (a grub screw) is placed in contact with the upper end of the plate 10 for fastening the second hinge body 5.

[0052] This position of the adjustment means 14 facilitates the work, even in visual terms, of the installer when adjusting the position of the sash 2.

[0053] Preferably, the pin 15 (associated with the profile of the sash 2) comprises a free end configured to afford the threaded housing 16 for accommodating the adjustment grub screw 17.

[0054] In light of this, the end of the pin 15 comprises a head 15a configured to define at least two flat principal surfaces (for example parallel to each other) such as to provide the space for the housing 16 for accommodating the grub screw 17.

[0055] Also in light of this, the housing 16 is made along the thickness of the end of the pin 15 and extends transversally to the longitudinal extension of the pin 15 in such a way that the adjustment grub screw 17 is positioned parallel to the axis of rotation 13Z of the hinge 3.

[0056] In practice, therefore, the grub screw 17 is in a position perpendicular to the pin 15, when the pin 15 itself is mounted on the profile of the sash 2.

[0057] As regards the plate 10 for fastening the second hinge body 5, the plate 10 comprises slotted holes 10a for the passage of the aforesaid screw means 11 for freely moving the sash 2 in height when the screw means 11 themselves are in a loosened configuration.

[0058] Preferably, the fastening plate 10 has at the end of it at least one indentation 18 within which the end of the pin 15 provided with the adjustment grub screw 17 is operatively accommodated. Preferably, the indentation 18 on the plate 10 is U-shaped and makes it possible to perform adjustment with the grub screw 17 without interfering with the relative position between plate 10 and sash 2.

[0059] In light of this, the grub screw 17 is operatively in contact with the bottom of the indentation 18 formed on the fastening plate 10.

[0060] As clearly shown in the drawings, the plate 10 preferably comprises two indentations 18, one at each end, to allow mounting of a right- or lefthand opening sash while maintaining the possibility of positioning the adjustment means 14 at the upper end of the plate 10.

[0061] Also in light of this, as mentioned previously, the indentation 18 is U-shaped, while the head 15a of the pin 15 has a perimeter shape such that at least two of its surfaces are flat (for example, parallel to each other) and operatively face the lateral surfaces of the indentation 18.

[0062] This arrangement thus makes it possible to stop both the fastening plate 10 and the sash 2 from making small unwanted movements about the axis Z when the screw means 11 are in the loosened configuration.

[0063] In addition to what has been described up to now, the pin 15 is associated with a counter plate 19 which is housed in a tubular chamber C defined by the profile of the sash 2 and which is fixed by respective screw elements 19a to the profile itself.

[0064] More precisely, the counter plate 19 is a shaped block provided with a series of threaded holes for coupling a surface of it which operatively faces the profile of the sash 2.

[0065] The counter plate 19 is slidably inserted in the tubular form of the sash 2 profile and fixed thereto by the screw elements 19a.

[0066] Similarly, the pin 15 is made to pass through a hole in the profile of the sash 2 and screwed into the counter plate 19.

[0067] Preferably, the fastening plate 10 of the second hinge body 5 is also associated with the counter plate 19 through the respective screw means 11 which pass through holes made in the profile of the sash 2.

[0068] The hinge 3 also comprises a further counter plate 21, similar to the aforesaid one, for fixing the plate 6 of the first hinge body 4.

[0069] In short, before the step of adjusting the hinge described above, the hinge must be mounted according to the following steps.

- Preparing and fixing the adjustment pin 15 to the profile of the sash 2.
- Preparing and fastening the two hinge bodies 4 and 5 on the fixed frame 1 and on the sash 2 and tightening the screw means 7 and 11.

[0070] The step of preparing and fastening the second hinge body 5 comprises placing the screw means 17 operatively in contact with one end of the plate 10 in order to configure a fixed point P for abutting and opposing the plate 10 itself.

[0071] More specifically, the screw means 17 comes into operative contact with the surface of the upper end of the plate 10.

[0072] Preferably, the positioning step comprises positioning the indentation 18 of the plate 10 at both sides of the pin 15 provided with the screw means 17. In other words, the pin 15 is accommodated in a U-shaped of the indentation 18 during the positioning and the fastening of the plate 10.

[0073] Adjusting the sash 2 further comprises a step of loosening the screw means 11 of the plate 10.

[0074] The purpose of that is to release the sash 2 from the second hinge body 5, that is, from the hinge 3 as a whole.

[0075] The procedure also comprises a step of operating (by screwing or unscrewing) the grub screw 17 (using the tool U) in such a way as to lift or lower the sash 2 relative to the hinge 3 along the axis Z.

[0076] This movement is achieved thanks to the fixed abutment of the grub screw 17 on the bottom of the indentation 18 of the plate 10.

[0077] As already stated, the sash 2 adjustment movement is also obtained thanks to the slotted holes 10a and

the indentation 18 which allow the sash 2 to be moved relative to the plate 10.

[0078] Once the sash 2 has been adjusted, the screw means 11 for fastening the plate 10 are again tightened with the sash 2 in the new position.

[0079] Preferably, the procedure for mounting the hinge 3 on the door or window fixture comprises a step of preparing and fastening the counter plates 19 and 21 in the tubular chambers C before mounting the rest of the hinge 3.

[0080] On these counter plates 19 and 21 are fastened the plates 6 and 10 and the pin 15 of the adjustment means 14.

[0081] A hinge made as described above fully achieves the above mentioned aims thanks to an extremely practical, secure and precise structural arrangement of the adjustment means.

[0082] Operation of the adjustment means directly on the sash, using the hinge as a reference abutment reduces the working effort required and makes adjustment quicker.

[0083] The presence of the adjustment means on the sash allows these means to be applied to hinges where the first hinge body applied to the fixed frame has either one or two plates.

Claims

1. A hinge for doors and windows having a fixed frame (1) and a movable sash (2) connected to each other by the hinge (3); the hinge (3) comprising:

- a first hinge body (4) having at least one plate (6) for fastening, through screw means (7), to a profile of the fixed frame (1) and a pair of cylindrical sockets (8, 9) which are coaxial and spaced from each other;
- a second hinge body (5) having a plate (10) for fastening, with screw means (11), to the profile of the movable sash (2) and a single cylindrical socket (12) which is operatively positioned between the two sockets (8, 9) of the first hinge body (4);
- a shared hinge pin (13) housed inside the three sockets (8, 9, 12) to define an axis of rotation (13Z) of the sash (2);
- adjustment means (14) configured to vary the position of the sash (2) along an axis (Z) parallel to the axis of rotation (13Z),

characterized in that the adjustment means (14) comprise a pin (15) associated with the profile of the movable sash (2) and having a housing (16) for accommodating a screw means (17) for adjusting the sash (2) along the axis (Z) relative to the fixed frame (1); the screw means (17) being operatively in head contact with one end of the fastening plate (10) of the second hinge body (5) in order to configure a fixed point (P) for abutting and opposing the plate (10) itself so as to lift or lower the sash (2) relative to the hinge bodies (4, 5), in a configuration where the screw means (11) for fastening the plate (10) are loose; the plate (10) having at the end of it at least one indentation (18) within which the end of the pin (15) provided with the adjustment screw means (17) is operatively accommodated.

2. The hinge according to claim 1, wherein the screw means (17) is placed in contact with the upper end of the plate (10) for fastening the second hinge body (5).

3. The hinge according to claim 1 or 2, wherein the pin (15) comprises a free end configured to afford the threaded housing (16) for accommodating the adjustment screw means (17).

4. The hinge according to claim 3, wherein the housing (16) is made along the thickness of the end of the pin (15) and extends transversally to the longitudinal extension of the pin (15) in such a way that the adjustment screw means (17) is positioned parallel to the axis of rotation (13Z) of the hinge (3).

5. The hinge according to any of the preceding claims, wherein the plate (10) for fastening the second hinge body (5) comprises slotted holes (10a) for the passage of the aforesaid screw means (11) for freely moving the sash (2) in height when the screw means (11) themselves are in a loosened configuration.

6. The hinge according to any of the preceding claims, wherein the screw means (17) is operatively in head contact with the bottom of the indentation (18) on the fastening plate (10).

7. The hinge according to any of the preceding claims, wherein the pin (15) is associated with a counter plate (19) which is housed in a tubular chamber (C) defined by the profile of the sash (2) and which is fixed by respective screw elements (19) to the profile itself.

8. The hinge according to claim 7, wherein the fastening plate (10) of the second hinge body (5) is associated with the counter plate (19) through the respective screw means (11) which pass through holes (20) made in the profile of the sash (2).

9. A method for adjusting a sash (2) of doors or windows comprising the movable sash (2) and a fixed frame (1) articulated to each by at least one hinge (3); the hinge (3) comprising: a first hinge body (4) having at least one plate (6) fastened, through screw means (7), to a profile of the fixed frame (1) and a pair of

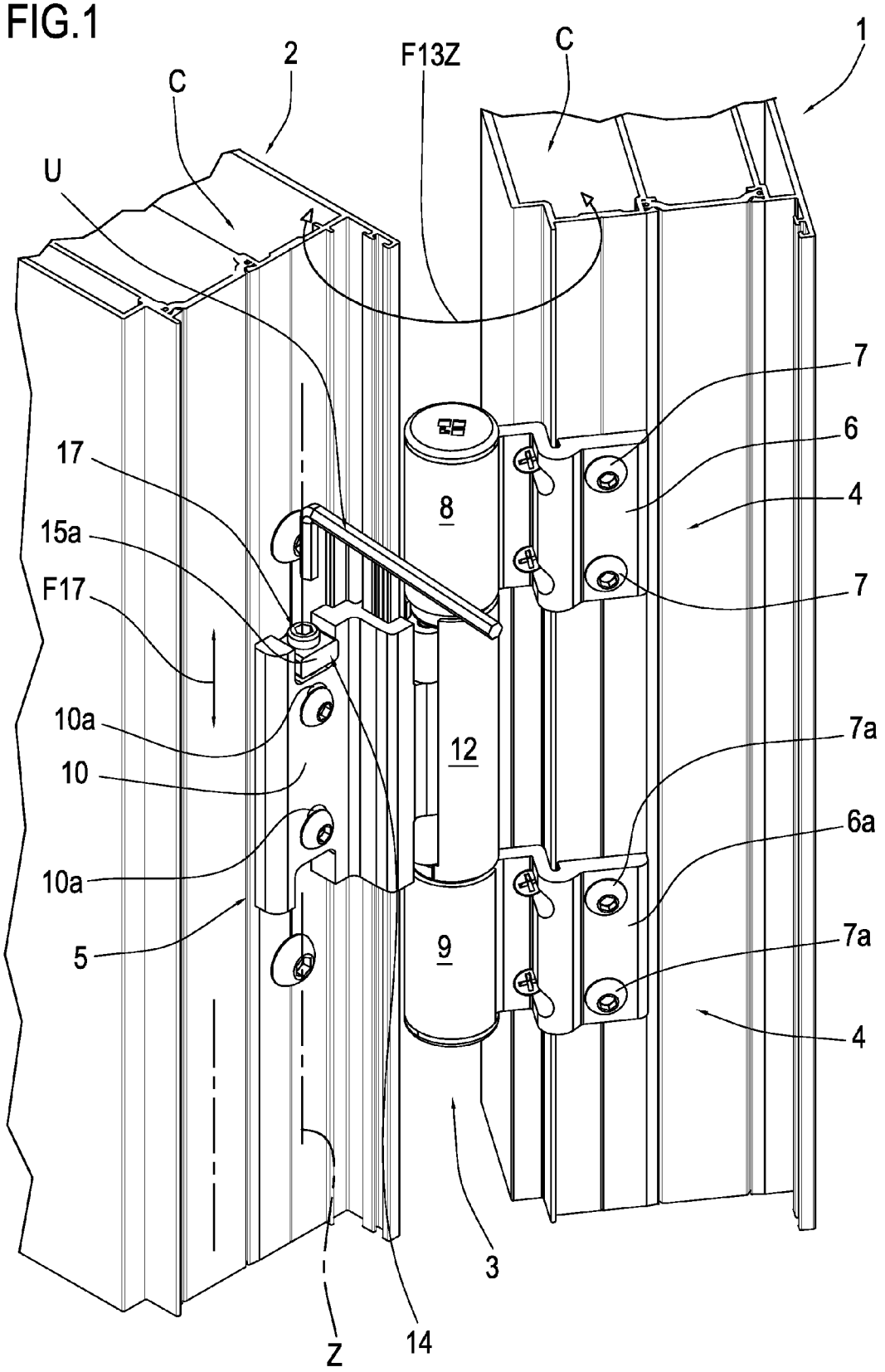
cylindrical sockets (8, 9) which are coaxial and spaced from each other;

- a second hinge body (5) having a plate (10) fastened, with screw means (11), to the profile of the movable sash (2) and a single cylindrical socket (12) which is operatively positioned between the two sockets (8, 9) of the first hinge body (4);
- a shared hinge pin (13) housed inside the three sockets (8, 9, 12) to define an axis of rotation (13Z) of the sash (2); and
- adjustment means (14) configured to vary the position of the sash (2) along an axis (Z) parallel to the axis of rotation (13Z),

characterized in that it comprises at least the following steps:

- preparing and fixing to the profile of the movable sash (2) a pin (15) having a housing (16) for accommodating a screw means (17) for adjusting the sash (2) along the axis (Z) relative to the fixed frame (1);
- preparing and fastening the plate (10) of the second hinge body (5) to the profile of the sash (2); the plate (10) having at the end of it at least one indentation (18) within which the end of the pin (15) provided with the adjustment screw means (17) is operatively accommodated in order to configure a fixed point (P) for abutting and opposing the plate (10) itself;
- loosening the screw means (11) of the plate (10) of the sash (2);
- operating on the screw means (17) to vary the position of the sash (2) relative to the hinge bodies (4, 5).

FIG.1



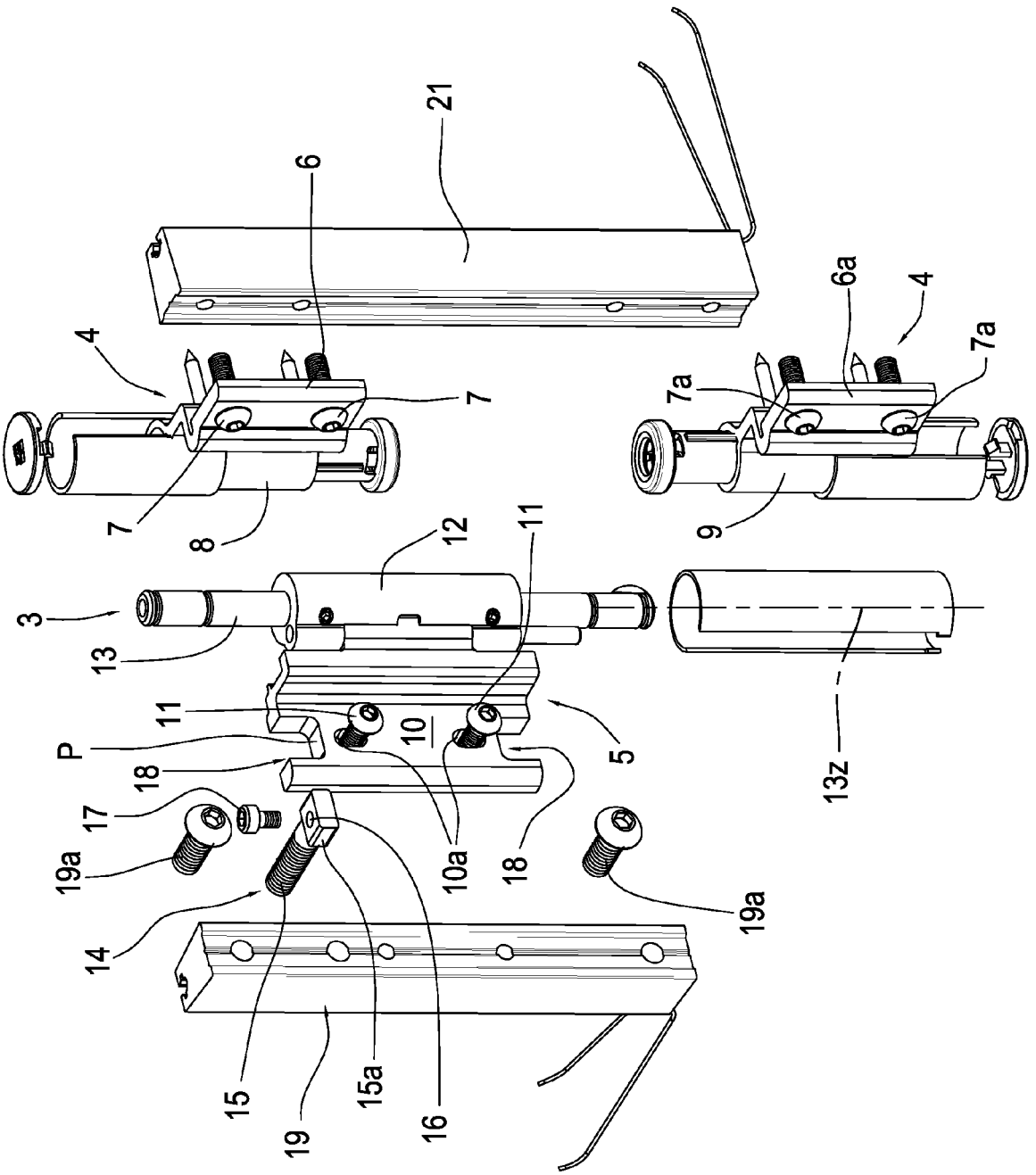

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FIG.2

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EUROPEAN SEARCH REPORT

Application Number
EP 11 19 0268

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 December 2011	Van Kessel, Jeroen

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 19 0268

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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REFERENCES CITED IN THE DESCRIPTION

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